approach

NOVEMBER 1982 THE NAVAL AVIATION SAFETY REVIEW

WATER SURVIVAL

IF you were the pilot flying the aircraft on this month's cover, you'd be underwater right now. You'd be confused, scared. Would you remember your egress training, or is water survival something you left behind with your drill instructor back in Pensacola, along with the weeping willows and aerodynamics?

You're still underwater. How did you do in your last swim qualifications? Four years is a long time. You wish you'd done more than just go through the motions.There's no smell of chlorine here, no line at the bottom of this pool, no instructor with a whistle in his mouth who's going to dive in immediately after you.

You dream of new lungs. It's up to you now — you, your survival gear, and the Angel that's on the way. God, if you could only have another chance, you'd really practice, you'd . . .

LT Colin Sargent

ARE YOU READY?

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Are you ready for water survival? See the inside front cover story.

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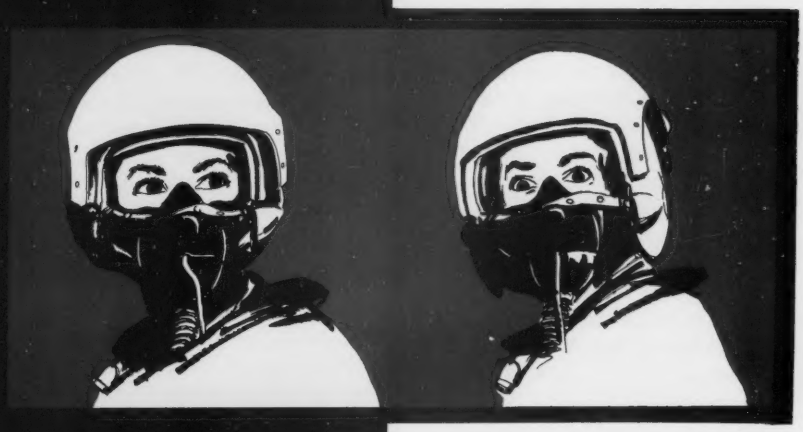
"He's going to hit

us!"

By R. A. Eldridge
APPROACH Writer



The setting: Night operations aboard a carrier. A downed F-14 was taxiing forward from the rear of the landing area.

As the pilot saw it:

"As we taxied forward past the No. 1 wire, I noted that the landing area lights and the Fresnel lens had come on. Moving forward past the No. 3 wire, my RIO stated that he felt uncomfortable taxiing down an active runway. I concurred. Passing the No. 4 wire, we were given a left turn signal, turned approximately 45 degrees, and stopped. At this time I heard the air boss scream 'Wave off! Wave off!' on the radio. I looked over my left shoulder and saw an A-7

on short final coming toward my aircraft. I transmitted to my RIO, 'He's going to hit us!' Hoping the A-7 might see me, I turned on my aircraft exterior lights and advanced power to MILITARY to move our aircraft out of the A-7's way. Ten to 15 feet later, I felt that the A-7 would impact the top of our aircraft. Yelling 'We're getting out of here!' to my RIO, I turned forward, reached down, and pulled the lower ejection handle. I estimate the position of the A-7 at the time I initiated the ejection sequence to be approximately halfway between the ramp and my aircraft, still descending.

"I was aware of forward movement of my aircraft toward the port side of the ship but not the speed. I would estimate ejection initiation occurred when the aircraft was 50 feet from the port side of the ship. I was looking forward at the ACM panel, saw a brilliant orange flash around the canopy, which I assumed to be the canopy leaving or the rear cockpit seat firing, and then heard a concussive bang. My next recollection is of tumbling end over end." (We'll leave the pilot in the air following his ejection and return to him later.)

As the RIO saw it:

"Once aft of the No. 1 wire, we were again turned around starboard 180 degrees and directed to taxi forward. About this time I noticed the lights of an aircraft a couple of miles aft. I then assumed this to be the lights of the plane guard or an ASW helo. As we continued forward, we both noticed the landing area lights and centerline strobe come on along with the lens mirror system. We continued slowly forward as I remarked that I felt rather uncomfortable taxiing across an active runway. My pilot joked as we saw a centered ball while taxiing over the No. 3 wire and said it might be the only centered ball I'd see today. *(How right he was!)* Continuing forward, we were turned approximately 45 degrees to port, still in or just forward of the wires. I turned around to the left in my seat to see what were obviously the lights of an aircraft on short final, almost over the ramp. I yelled 'Unprintable!', heard a loud explosion, and felt a combined sensation of tumbling and losing consciousness. My next awareness was of twisting around in midair, suddenly realizing that the ejection sequence had been initiated, and watching the ship slide by in front of me." (We'll also return to the RIO later.)

An A-7E that had completed a night bombing/SSC mission was holding in the stack at Marshal with an approach time of 0440. At 0433, the air wing LSO and two squadron LSOs were waiting in a compartment on the 03 level, adjacent to the flight deck, aft of the LSO platform. They were unable to proceed to the flight deck because of aircraft turning just above their exit to the flight deck.

The pilot of the A-7E (Joyride 306) had the ILS display selected on the HUD (heads-up display) and the ACLS (automatic carrier landing system) display on the ADI (attitude direction indicator). He reported a good ILS.

CCA: *Joyride 306, lock on, say needles.*
306: *Three zero six, centered and up.* (The pilot had previously observed a landing check light. At this time he observed the ACLS needles locked in the center and reported the ILS needles he intended to fly.)
CCA: *Three zero six, concur, continue Mode 2, centerline is slightly left.*
CCA: *Three zero six, centerline is slightly left at 4 miles.* (The plane ahead of 306 had been told the deck would not be ready. He was waved off and told to remain dirty while turning downwind.)
306: *Zero six.*
CCA: *Three zero six slightly below glidepath, centerline is slightly left, two and three-quarters miles.*
306: *Zero six.*

Following this transmission, the air officer announced over the 5MC: "Launch complete on the waist, make a ready deck. First aircraft at 2 miles." He was aware that he had an F-14 in the aft landing area taxiing forward. There was also an A-6 turning up aft of the LSO platform. The LSO V-2 phone talker reported, "LSO on." This communication check was acknowledged by the Pri-Fly V-2 phone talker. When the LSOs heard the "launch complete" call by the air officer, they proceeded to the flight deck.

The air officer directed Primary personnel to turn on the landing area lights (centerline, box, drops, strobe, and athwarts) and the Fresnel lens. In Primary, the FLOLS (Fresnel Lens Optical Landing System) operator noted that the LSO platform console lights were not visible and the LSO V-5 phone talker had not checked in on the 11JG circuit. He advised the PLAT lens room to turn on the lens lights. When they were turned on, he reported it to the air officer, who acknowledged that the lens was on.

306: *No drop lights.*
306: (2 seconds later) *There they are.*
CCA: *Three zero six, slightly above glidepath, centerline is left, a mile and a quarter.*

At this point, the air wing LSO in the port aft catwalk observed the A-7 in landing configuration at about 1 mile. He noted the FLOLS was on in the night intensity setting as he was running to get to the platform. His progress was impeded by the A-6 with a towbar and tractor and the jet blast from the F-14 forward in the landing area. When the LSO arrived at the platform, the phone talker was frantically attempting to raise the metal cover on the LSO console to get to the waveoff pickles. The V-5 phone talker was wearing an *unloaded* very pistol in a holster with a full cartridge pouch.

CCA: *Three zero six, above glidepath, centerline is left, three-quarters of a mile, call the ball.*

The pilot reached down to check

his headset connection because he did not hear his ball call acknowledged by the LSO *(no acknowledgement on a ball call is a mandatory waveoff).*

Air Officer: *"No chance, Paddles"* on the 5MC.

In CCA, the ACLS console operator selected the ACLS waveoff command button, having observed a foul deck indication on the PLAT and not having heard an LSO acknowledge the ball call. His range estimate was one-fourth to one-eighth of a mile.

The *Corsair* pilot did not see the waveoff display in the cockpit.

Air Officer: *I said no chance, Paddles, no chance! Wave off! Wave off!*

Unfortunately, the air officer's urgent transmission to wave off went out on the departure frequency to which his radio was set, vice the A-7's landing approach frequency. This was the frantic transmission that the F-14 crew heard, since they were still tuned to departure frequency after having gone down on the catapult.

At 04:42:49, an LSO-initiated waveoff was recorded for posterity on the PLAT. One second later, the nose of the A-7 was over the rounddown. The Primary FLOLS operator actuated his console waveoff button at the same instant. The PLAT switched to the centerline camera, and the A-7 was clearly distinguished, lined up slightly right of centerline, with mainmounts straddling the F-14's starboard vertical stabilizer. At the instant of collision, the PLAT island camera depicted the dual ejection of the F-14 crew. At MILITARY power, the now-crewless F-14 disappeared over the port side of the carrier, into the water.

CCA: *Three zero six, level angels two, turn left heading zero six five.*
306: *Yeah, we just clipped a plane on deck.*
CCA: *Three zero six, roger, take angels five overhead. We'll join somebody on you, sir.*
306: *Roger.*

Subsequently, another A-7 joined on the mishap A-7 to ascertain the damage. Although the damage to the A-7 was minor, a decision was made to barricade the *Corsair* because the tailhook was damaged. Approximately 2 hours later, at daylight, the pilot made a successful barricade engagement.

The pilot's ejection and rescue. "I felt great relief at seeing my RIO's parachute canopy fully deployed approximately 150 feet beneath me. I had been concerned that he might hit the wing of the A-7 as it flew toward my aircraft. I then hoped my parachute would deploy properly. I wondered if I could survive a 250-foot fall into the water if it didn't deploy. I then felt a mild, comfortable opening shock and noted that I wasn't falling fast, so I knew I had a good chute. I noted that both of us were going to clear the ship to port, my RIO by approximately 50 yards, myself by about 100 yards. I estimated my time in the chute to be about 10 to 12 seconds.

"As I approached flight deck level, I inflated my LPA and it worked perfectly. I elected not to release my upper Koch fittings until water entry because there was a lot of wind, I would not land near the ship's wake, and I was swinging significantly in my chute. I had no difficulty seeing the water approach me and released both fittings properly. I went underwater approximately 5 feet and came to the surface immediately.

"My first concern was to get clear of the canopy, which was close to me. Some shroudlines were on me. I pulled away from the canopy and looked around. I saw a strobe light 50 yards away and felt my RIO was safe. I then began to open my survival vest to extract my strobe light. At that time a wave hit me and washed the canopy on me again. I felt a shroudline pull on my right leg, at which time I reached down and freed it from my leg restraint fitting. I paddled for about 30 feet before attempting to locate my strobe light. I had difficulty locating the strobe, so I took out my flashlight and attempted to look for it. I removed the red lens and discarded it. At that time I heard the sound of an approaching SAR helicopter. I abandoned my search for the strobe and pointed the flashlight at the helicopter. He saw it immediately and headed for me."

After a swimmer was dropped in the water, the pilot was successfully attached to the rescue harness and hoisted into the helo. He sustained no injury whatsoever during the entire evolution.

The RIO's ejection and rescue. "I pulled both LPA toggles at or slightly below flight deck level, felt for and found my upper Koch fittings, and looked down to judge height over the water. At 5 to 10 feet, I popped both upper Koch fittings, dropped into the water, and bobbed up to see my chute collapsing at least 30 to 40 feet away.

"My next action was to attach my strobe onto my helmet (via *Velcro*). My right waist lobe of the LPA had inflated but had not popped out of its cover. I fumbled with this for a couple of minutes, then suddenly realized my seatpan was still attached. Both lower Koch fittings were released easily, but I experienced some difficulty in disconnecting the oxygen quick-disconnect. Once I freed the oxygen hose, I pushed the pan out in front and attempted to deploy the raft. I was unable to open the pan and, realizing that the helo was nearby, shoved it away and swam to be clear of it.

"After a few minutes, I attempted to use my PRC-90 but was unable to free the helmet plug-in (even in the

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light of my flashlight). I did not want to remove my helmet to hear the radio, so I simply selected the beacon position for a while until the SAR helo was close by. I lowered my clear visor to protect against spray from the helo and awaited pickup. The swimmer hit the water about 30 feet away, swam over, attached the horse collar hookup to my D-ring, and we were pulled into the helo without incident."

Debris from the collision was propelled by the jet exhaust of the mishap F-14 across the flight deck toward the area aft of the island. It caused minor injuries to five flight deck personnel and killed one technician. When the F-14 canopy departed at the time of ejection, it struck the technician, who was located forward of the starboard intake of a parked F-14. The canopy first impacted the flight deck and was blown toward the parked F-14 by jetwash from the mishap F-14.

Air Officer's Waveoff Button. The FLOLS source light intensity adjustment synchros had been inoperative in Pri-Fly and at the LSO platform for 4 to 5 weeks. The master console in the PLAT/lens room was being used to activate and control the lens light intensity. With lens control authority in the PLAT/lens room, neither the Pri-Fly console nor the air officer's waveoff button activated the waveoff lights. *The air officer was aware that his waveoff button would not activate the waveoff lights.* Therefore, when the Primary FLOLS operator activated his console waveoff button, the waveoff lights failed to flash. Later, when the schematics were reviewed, it was found that the air officer's waveoff button should work, regardless of which FLOLS console had control. During an in-depth wiring inspection, the air officer's button was discovered to be misrigged.

During the approach, the air officer advised flight deck control that the A-7 (306) wouldn't make it and that they would trap the next aircraft. He further advised the CATCC watch officer to "take 306 around" when the A-7 was about a mile and a half from the ramp.

The watch officer started to relay this information to CCA but heard CCA transmit to 306, "Three-quarters of a mile, call the ball." Therefore, he chose not to pass the word to CCA at that time, since the A-7 was under LSO control *(he assumed).* Nor did he report this decision to the air officer.

At the time of the mishap, the rotating beacon, located aft of the island and controlled by the air officer, was red. This indicated there was no clearance to land aircraft.

- **Analysis of the mishap.** There are multiple safeguards designed into carrier operations, particularly at night, to prevent a mishap such as this one from happening. Yet each safeguard failed and the mishap occurred. Why? More than likely, the simple answer is that human beings are involved and human beings make mistakes. This was not the first time a mishap such as this has occurred, and it probably won't be the last. Let's look at some of the safeguards.

- **Activation of FLOLS and landing area lighting.** Paragraph 536 of the CV NATOPS states: "Except for the purpose of conducting tests, neither the lens nor the landing area lights shall be turned on until the controlling LSO establishes positive communications with the air officer." Since the lens and landing area lights were turned on before communications were established with the controlling LSO, that safeguard was nullified. Without lights, the pilot would not have attempted to land and would not have made a ball call when told to do so by CCA.

- **No acknowledgement of ball call.** The built-in safeguard of not receiving an LSO acknowledgement of a ball call mandates waveoff by the pilot. This did not occur. Even though the pilot was required to take a waveoff, a series of circumstances occurred to lead him down the primrose path. The fact that he recognized the centerline droplights were not illuminated initially, reported same, and then, 2 seconds later, noted that they were turned on, created the impression that the LSO had responded to his call of no droplights and had turned them on.

- **Very pistol at LSO platform.** The LSO phone talker is equipped with a very pistol as an emergency signaling device. Unless conditions exist which might require its use, the very pistol is not loaded *(it is doubtful if there would ever be a more opportune time to use it than in this instance, yet it was impossible to do so).* This was an emergency safeguard that was not set to produce a short-notice effect.

- **Air officer's waveoff button.** The schematics showed that the air officer can initiate a waveoff at any time, regardless of which FLOLS console has command. But because it was misrigged, this safeguard fell by the board.

- **Pri-Fly manning.** On the night of the mishap, the air officer was the only qualified officer in Pri-Fly. The assistant air officer's position was vacant. During a typical launch/recovery evolution, the air officer maintains an almost continuous dialogue with a large number of personnel. He commands and is the hub of a complex communication network consisting of at least 15 separate intercom, radio, announcing, and telephone circuits. At the same time, he is receiving and returning reports of the Pri-Fly crew and coordinating the entire flight deck and terminal area operations. Even with the assistant air officer present, the simultaneous launch/recovery evolution presents a tremendous workload. Without such assistance, Pri-Fly duties can reach excessive proportions. Having the assistant air officer in Pri-Fly is another safeguard. It is pure conjecture, of course, but the mishap might have been prevented if there had been two officers in Pri-Fly to divide the workload.

- **Pri-Fly FLOLS operator.** Among

his responsibilities is to establish two-way communication with the LSO V-5 phone talker and to ensure that the lens is activated only when directed by the air officer. Prior to being directed by the air officer to turn on the lens, he'd been unable to establish contact with the LSO V-5 phone talker. Had he reported this to the air officer, upon receipt of the lens command, the air officer would probably have noted his error and retracted his order. This safeguard could have prevented the mishap.

• **FLOLS source light intensity adjustment mechanism.** This adjustment was faulty on the Pri-Fly console. Because of this, the FLOLS light sources had to be activated and adjusted from the PLAT/lens room. This also resulted in denying the air officer the use of his waveoff button. Had the malfunction not been present, the Pri-Fly console would have been in command, thereby allowing the Pri-Fly FLOLS operator to issue an effective waveoff.

This mishap illustrates the need to adhere to proven operating procedures and to emphasize the premium of the concomitant safeguards those procedures provide. In this case, the multitude of redundant safeguards (instituted as a result of lessons learned from past mishaps) failed. Had just one of these preventive measures been correctly exercised, this tragic loss of life and assets would not have occurred.

Constant reemphasis on the need to comply with existing procedures is of more importance than recommending additional ones. The procedures to prevent this type of mishap are in existence and have been evolved over a long period of time. There's no magic involved. All we have to do is abide by our own set of rules. ◄

First Light. It was first light at NAS Southeast. The P-3 maintenance check crew was tasked for a short duration (once around the field) flight to check the operation of the flaps, previously suffering a flap asymmetry gripe. The bird was scheduled for a mission contingent upon the success of this flight.

The preflight went smoothly; weather and visibility were good (first light). The crew was thoroughly briefed on the anticipated evolution to follow. Engines were started, perfunctory ground checks of the flaps proved positive, and it was off into the wild blue.

The hop went according to plan, flaps flapping as per MIMs. Abeam on the second downwind, the copilot called for landing. Gear down, checklist complete, tower clearance to land, wind calm, no reported traffic, a little hazy (first light, you know). The PPC rolled into the groove (yes, we multi-types have a groove), called for landing flaps – but wait! There was a water spot that appeared to be moving on the runway (it had not rained in a week). A quick check with the tower confirmed the landing clearance amid "no traffic." The moving water spot became a moving *Cessna* 150! A waveoff was initiated and the tower was convinced there was indeed an aircraft on the rollout. The excited (but surely alert) crew was cleared downwind and executed a normal landing.

Okay, it seems that a *Cessna* flown by a student pilot had slipped into the NAS field, incorrectly identifying it as a local civilian field. It was the first solo cross-country destination in his short flying career. The local civilian field had no tower, hence no call for landing. His failure to have running lights was a slight oversight on his part (he had been flying before sunrise). No landing light, no radio call, no alertment for the NAS tower folks, therefore the "no traffic" call.

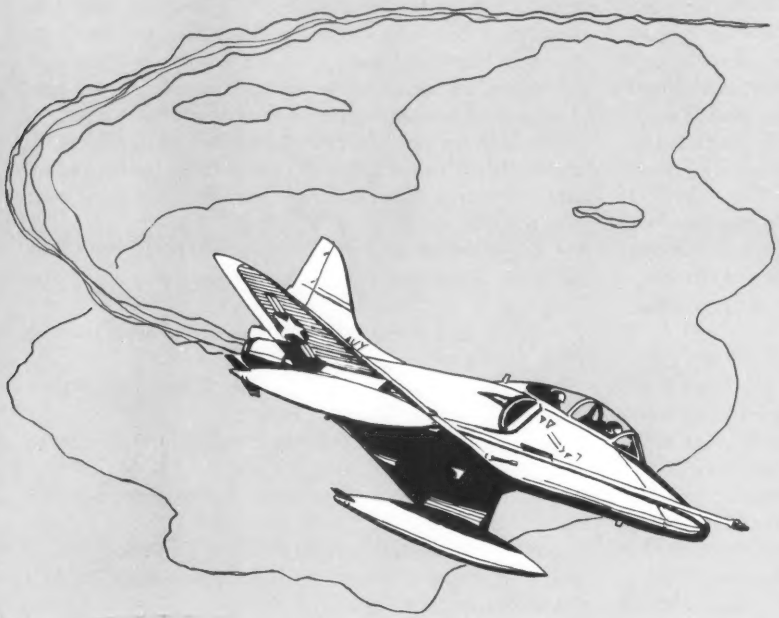
Naturally NAS ops became quite excited when the hapless student started taxiing among the P-3s lumbering out for the first launches of the day. Unable to raise the *Cessna* on the radio, a band of yellow trucks corralled and herded it to base ops. After the predictable confrontation with the ops officer, the distraught student pilot climbed into his steed, started, taxied, and took off just as he arrived – covertly, much to the agony of the NAS ops yellow trucks chasing him. Good stick, not much of a talker. Guess the fellow hadn't progressed to the radio phase of his training.

Sound like an aviation sitcom? Facts oftentimes are funnier than fiction. It's inconceivable that something as unpredictable as this incident could occur in what we naval aviators have come to consider our protected airspace. To one P-3C flightcrew and a tower watch team, a basic safety theme was reiterated – expect the unexpected!

Submitted by
CDR T. A. Richardson
VP-60

Superior Headwork or Superior Skill? The flight was briefed as a routine training hop that would include simulated emergencies. Things went smoothly for the first hour with the PUI performing the various NATOPS emergency checklists professionally. The next simulated emergency introduced by the HAC demonstrated a power loss to the No. 1 engine. In attempting to correct the simulated emergency, the PUI followed emergency procedures correctly but to no avail. The problem appeared to be an actual malfunction in the emergency throttle. The HAC

AIR BREAKS



"cleaned up the cockpit" and beeped the No. 1 engine power level to NORMAL. He then reinitiated the simulated emergency. The emergency throttle, after an inordinate amount of continuous actuation, responded and brought the engine to the desired power level. When the HAC attempted to clean up the simulated emergency, the engine would not reduce power. Because of this, when placed in an approach profile, the aircraft would overspeed prior to the collective reaching bottom. Since the simulated power loss had now become an actual overspeed of the No. 1 engine, the NATOPS checklist was performed but didn't correct the problem. The crew declared an emergency, dumped stores and fuel, and proceeded to Homeplate. When a green deck was obtained, the No. 1 engine was secured and an uneventful recovery was made.

Though they came through in the clutch, was it really necessary for this crew to find themselves in this situation at all? If a malfunctioning emergency throttle on deck is a downing discrepancy, why was it not when initially discovered in flight? A return to base and on-deck troubleshooting is far more preferable to a single-engine approach, any day.

So the next time you're out practicing emergency procedures and an aircraft system fails to respond properly, why not use some of your superior judgment and head for home *before* something happens that requires the use of your superior skill.

By LT R. P. Mason

Two-time Pro. Shortly after takeoff as No. 3 on a top gun adversary training flight, LT Blake Stichter (VF-128, PIC) and LCDR Steven Weber (VC-1, co-pilot) noticed a slight vibration in their TA-4 *Skyhawk*. The crew assessed the situation as a probable nosewheel shimmy but kept a close watch on all engine instruments. As power was added to 93-95 percent during the final phase of the rendezvous, vibration increased. LT Stichter requested a visual check from another aircraft to confirm that no doors or panels had failed. The other aircraft dropped back to check and reported a large stream of blue smoke coming from the tailpipe. LT Stichter simultaneously noted a flicker in the oil quantity low light. He commenced an immediate left turn toward NAS Miramar and declared an emergency while smoothly reducing power to 87 percent. His position was 10 nm from Miramar at 7,000 feet MSL. At 8 nm, the oil pressure went from 42 to 0 psi and the vibration increased to a level which made communicating and instrument reading difficult. LT Stichter stated his intent to arrest on Runway 06L. He smoothly raised the nose to reduce to landing gear extension speed, being especially careful not to impose any extra G-loading on the aircraft. At 220 KIAS, he lowered the gear and flaps and executed a perfect precautionary approach to an arrested landing on Runway 06L.

A postflight inspection revealed three holes in the engine casing turbine area, the largest of which was 6 inches in diameter. One turbine blade was found lying in the aircraft engine bay. The quick application of NATOPS emergency procedures, expert airmanship, and crew coordination in this instance, saved a valuable adversary aircraft from destruction. LT Stichter (a second-time COMNAVAIRPAC Pro-of-the-Week) and LCDR Weber are commended for their superb performance during this emergency. Well done!

"Where the Heck A

By LCDR Steve Gillis
NAS Boca Chica, FL

HOW many times have you heard that one? When you're a hundred miles from the nearest NAVAID, over the briny deep, and have been tooling around for an hour since your last known fix, this is a serious question. Now sprinkle in several other teasers. The sinking shrimp boat you're looking for is barely 60 feet long (with a white hull that matches the whitecaps) and he's telling you that he's not where he said he'd be. Not only that, you have just 2 miles of visibility at 110 feet, anyway. This, sports fans, is a typical maritime search and rescue mission.

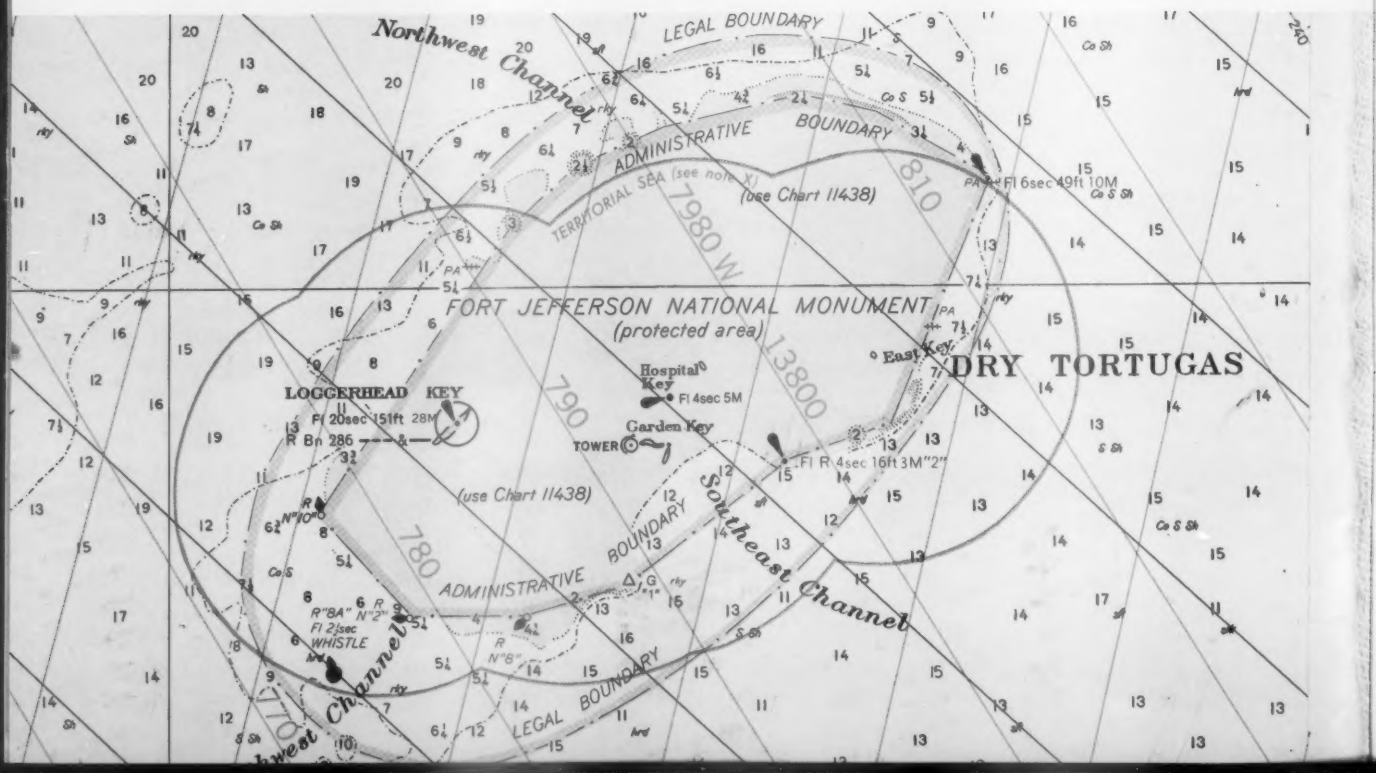
NAS Key West has the answer to all those questions and more. **LORAN C!** The same kind of equipment that the sinking shrimp boat has. We're using a spare AIRLANT LORAN C unit in one of our H-3 SAR birds. The results have been spectacular.

Most fishing and shrimping boats carry LORAN C for navigation. Why? Because LORAN C is a highly accurate system for pinpointing positions at sea level, where there are no visible reference points. Sea level to 500 feet is the SAR helo arena. With LORAN C and a VHF marine radio telephone installed, the chances for a successful mission are greatly increased. Now the vessel in distress is using the same type of position fixing as the rescue vehicle.

LORAN C is made up of a series of chains. A single chain consists of a master and several secondary transmitters. Each LORAN C chain is identified by a unique four-digit group repetition interval code. This number is the pulse repetition interval in microseconds. To obtain a single line of position, both a master and a secondary transmitter are required. Therefore, to work up a fix, you need a master and two secondary transmitters. Once these conditions are met, geographical position can be plotted on a NOAA chart.

The LORAN C set currently used by NAS Key West SAR is the TI9900N. The features incorporated in this set are ideal for search and rescue missions. The most significant features are:

- Latitude and longitude conversion. This corrects time difference lines to a corrected geographical latitude and longitude.
- Waypoint programming. This allows preprogramming of up to 10 waypoints.
- A special waypoint. When entered, it's always your present position.
- Range and bearing to your next waypoint are calculated and displayed.
- Course, groundspeed, and time and distance to go are computed.
- A built-in steering indicator lets you know when you're on or off course. It's very similar to flying the CDI on a TACAN approach.



A typical mission now goes like this. Say the Coast Guard calls with an emergency about a fishing boat crewman who has lost his arm. He was at latitude X and longitude Y at time 0000, headed east at 12 knots.

After starting up the helo and warming up the set, you enter your present position and the vessel's last known position as waypoints. Then you select range and bearing. The readout will give you an initial course to fly and the distance to the vessel.

Once airborne and clear of the control zones, you can enter your present position and then the vessel's for updated range and bearing information.

Next, you select crosstrack error and fly the "bubble" like the CDI on TACAN. After 5 minutes or so, you select ETR. You'll get the estimated time en route based on your average groundspeed.

Once in contact with the vessel, get his latest position and enter it as a new waypoint. By selecting your present position against his current one, arriving at the wrong place is eliminated, because the new range and bearing information should lead you right to him.

After completing the transfer, enter your present position to the waypoint you've selected as home, and you'll get range and bearing information back to base.

If a search is required, the TI9900 set lends itself to three very accurate patterns: parallel track, parallel circle, and sector search. With only LORAN C in your aircraft, by using combinations of waypoints, range and bearing readouts, and the crosstrack-error feature, you can fly exact patterns over the open ocean. The only limitation you have to the pattern you fly with LORAN C is your imagination.

Installing it in the H-3 is easy. The set fits nicely in the space on the center console that was occupied by the PT-434A Tactical Display Plotting Board. You need a power supply pack to reduce 24-volt d.c. to 13.6-volt d.c., but this fits comfortably on the platform where the KIT 1-A for the IFF used to sit. The 24-volt d.c. receptacle on the cabin dome light panel serves as an initial power source. The straight-wire ADF antenna works fine, so an extra antenna isn't needed. Now, install a good VHF marine radiotelephone, and you have the best available combination of navigation and communication a maritime search and rescue helo pilot can ask for.

When a NAS Key West SAR pilot asks that age-old question, "Where the heck are we?" there's no panic in his voice because he knows his copilot will respond in latitudes, longitudes, and LORAN C TDs and can tell him instantly which way and how far to go. ◄

LUMINESCENT

By Capt Charles R. Smith III, USMC
HMAS ALBATROSS
Royal Australian Navy
Nowra, New South Wales, Australia

The South China Sea sunset was its typical blend of ferocious pastels. I will never understand how there can be so many different shades of different colors in the same place at the same time.

As I walked back to our line area from Operations, I reviewed the weather brief I'd just received. It was going to be a night like all South Pacific nights — balmy, fine, with the odd isolated thundershower. Nothing to worry the duty night flier.

Start and taxi were uneventful. Pretakeoff checks were normal with everything functioning as advertised. By now the exquisite sunset of an hour before had faded into darkness. I called for and received takeoff clearance.

Adjusting my throttle to MILITARY, I was reassured by the smooth, swift response of the single P-408 behind me. Wheels up, flaps up, spoilers off, external transfer on. "Mighty dark out here tonight," I thought.

"Attention all aircraft, this is Cubi Approach on Guard. We have just lost our radar due to a lightning strike. Considerable delays expected for landing aircraft due to deteriorating weather. TACAN approaches only. Suggest Clark Air Force Base as alternate."

In about the space of time it took the words "deteriorating weather" to form as a question in my mind, my canopy was transformed from clear *Plexiglas* into hundreds of rivulets of orange and blue fire. It looked as if the entire canopy were burning and melting and streaming back with the airstream. It was so bright I didn't need cockpit lighting to see my instruments. I decided that it was only St. Elmo's Fire and not my canopy that was burning.

"Good old Met," I thought, "right again." The next instant I was blinded by a flash of light that was so intense I could almost feel it. Down with the dark visor, on with the thunderstorm lights, doublecheck harness locked, anti-ice on, slow to 250 KIAS. The turbulence followed quickly as the elements proceeded to amuse themselves at my expense by tossing me around like a toy while treating me to a light show of unbelievable intensity and color. Maintaining a wings-level attitude was hopeless. I was fighting just to get the aircraft to pass through a wings-level attitude occasionally in its wild gyrations.

Suddenly, the air was still. Wisps of cloud dropped rapidly away beneath me. The rivers of fire on the canopy were replaced by the frosty stars seen on a clear night at 25,000 feet. I could relax for a moment. Now to decide whether to divert to Clark Air Force Base or try and get back into Cubi Naval Air Station.

According to reports from pilots on final, the weather really wasn't that bad down below. The ceiling was about 1,000 feet with pretty good visibility in rain but with a strong, gusty crosswind. There was, however, a considerable delay before I could land, due to TACAN approaches only and arrested landings by all concerned on the very wet runway. Since I had only recently taken off, I had plenty of fuel and therefore elected to land back at Cubi. I was assigned a holding altitude of FL220 at the IAF. As the top aircraft in a stack of eight, I had seven A-7s beneath me. "I reckon I'll be up here awhile," I thought.

My altitude was a good one. I was mostly on top of the weather. Occasionally, I'd fly through the top of a thunderstorm but only for a brief period. We kept moving the holding point around to keep it out of the thunderstorms as much as possible, for now there were many of them moving through the area. Still, there was no pilot who seemed in any great difficulty.

For my part, I was enjoying a beautiful night. Clear skies slept above me, while just below the surface of the storms, I saw a gray, almost luminescent, light. The air was still except for the turbulence I encountered while flying through isolated tops of the thunderstorms.

Suddenly, my airplane gave what I can only describe as a shudder. It seemed to tremble along its whole length, starting at the nose, continuing through the cockpit, and then moving back along the fuselage to dissipate, I suppose, from the tail. Just as abruptly as it began, the vibration ceased. It only lasted for a second at the most. I quickly scanned my engine instruments. All indications were normal. My flight instruments were showing me what they should have been, also.

I'd never felt anything like that before, nor have I since. As I was trying to arrive at some sort of explanation, my horizon, formed by the gray cloud tops and the night sky,

T MEMORIES

instantaneously went from level to skewed at an odd angle as my aircraft rolled abruptly and plunged into the clouds beneath me.

Without being able to stop and think of just how I'd arrived at my present situation, I reacted by training and instinct. Although the airspeed indicator told me I had plenty of airspeed to fly, I obviously did not have enough. So, with the altimeter unwinding fast, I went to MILITARY power (and once again felt the reassuring boot in the butt of the P-408), stopped the attitude gyrations, pulled to the nearest horizon, and tried to stay out of buffet. With my wings level, I felt myself fall through 8,000 feet, smack in the middle of a holding stack of aircraft. I was still falling at 7,500 feet when, *boom*, I'd recovered and flown out of the area at Warp 9. I congratulated myself that at least I was flying at that airspeed.

I called Approach and informed them of my situation and that I was climbing back on top where there were no clouds. They rogered, but having no radar, they could be of no help with traffic separation. It was only by the grace of God that I didn't hit another aircraft in my fall.

Back on top again and being sure to keep my speed up, I was wiping the sweat off my brow with a trembling hand, wondering why my airplane had suddenly fallen out of a clear sky for no apparent reason, when like a thunderbolt, so to speak, the reason became apparent.

I hastily broke out my flashlight and shined it first on the port intake, then on out and to the sharply-swept leading edge of the port wing. As long as I live, I'll never forget the sight that greeted my eyes. Glinting dully in the beam from my flashlight was a sheet of ice completely obscuring the entire leading edge of the wing and built to a thickness of several inches. A quick check of the starboard side showed the same. "Well, darn," I said, or words to that effect.

I called Approach and told them about my icing problem and requested an altitude high enough to stay completely clear of clouds. I intended to keep my airspeed fast enough to keep the airplane flying and get rid of the ice at the same time.

None of the other aircraft was having problems with ice, so evidently the freezing level was between them and me. Since I was the highest aircraft in the holding stack, I requested and received clearance to remain on top until my approach time. I'd had quite enough of clouds for one night.

As I flew around in my holding pattern, I monitored the ice on my aircraft and watched with satisfaction as it slowly disappeared.

Finally, it was my turn on the approach. Just a simple straight-in TACAN to an arrested landing. The LSO on station was a friend of mine. "No sweat," I thought, although by now I was a bit fatigued. I'd used a lot of nervous energy. The old adrenaline had been pumping a fair amount of the time.

On the approach, I began a rapid descent to the lower altitudes while slowing. Gear, flaps, and hook all came down. Adjusting to optimum angle of attack, I continued the descent and broke out around 1,500 feet. The visibility wasn't bad underneath, but it was raining hard with a strong crosswind from starboard. There was the ball. I called it and went under LSO control.

"You're a little fast," the man said, "right for lineup." "Damn this crosswind," I thought. It was a fight to keep the ball anywhere near the center. "Don't drop your nose," I said to myself. "Right for lineup, a little attitude," from the LSO. Touchdown was fast and low with a left drift on a wet runway. I felt the comforting tug on my harness as the hook engaged the wire. In spite of this, I was slightly left of center and going further left. Full right rudder was to no avail. I was still drifting left but slowing. Finally I stopped, white knuckled, with my nosewheel mere inches from the left edge of the runway.

After hook disengagement, I taxied back to the line in driving rain. I don't recall thinking about much at the time. I was just glad to be back. I climbed out of the cockpit on rubbery legs with only the necessary amount of conversation with the ground crew this time.

I got a ride up the hill to the bar where I was to meet the LSO for a debrief. I didn't look forward to it with particular relish. He handed me a beer as I walked in. "You hamburger," he said.

At that moment in time, I did not feel like arguing. ◄

Vectors to Flameout

By LT Dave Coss
HC-6

FOR deployed squadrons and detachments operating at sea, the extended *over-the-horizon* mission is an inevitable, if not sometimes uncomfortable, proposition. I'm sure many of you have arrived over a point in the ocean where USS Homeplate was "supposed" to be but was somehow conspicuously missing. Staring at nothing but water and seaweed tends to leave a distinct sinking feeling in the pit of your stomach that is not soon forgotten. This story concerns just such a well-intentioned goose chase.

Aboard a MARS-class AFS on my first cruise, our H-46 detachment was nearing the end of a 6-month deployment. Our mission for the day was a routine two-plane flight for passenger/mail/cargo shuttles between two carriers, a mission that had become commonplace for us. Our ship could not give us a positive position for the carriers but assured us they would be within 100 miles, based on positions indicated in message traffic. Squadron SOP sets 100 miles as the limit for flight from one ship to another (when fuel is available at the destination) due to the inherent navigation limitations of the H-46 and our 100-mile round-trip fuel radius. SOP does, however, make allowances for alteration of this limit at pilots' discretion when factors such as weather, available navigational aids, and operational necessity legislate favorably. Throughout the cruise, our AFS had always been successful in maintaining her position within 100 miles of any customer ship when tasking us with a mission.

Upon takeoff, our flight of two got a positive TACAN lock-on that showed the carriers at about 88 DME, somewhat greater than our normal ship-to-ship evolution distance but posing no problems. The real excitement would come during our return trip, since Homeplate's TACAN

was totally inop (having been a CASREP item for over 2 months) and we had no idea how long we'd be working for the carriers. We'd have to rely strongly on our ship's PIM and any vectors the carriers could give us. Weather that day was no factor — your basic midsummer Med CAVU day.

We arrived at the carriers without incident and began our scheduled shuttles. After 4 hours of shuttles interspersed with some inevitable Starboard D time, we were on the deck of one of the carriers, refueling for our return to Homeplate. Relaxed, I asked the air boss for vectors to our AFS. His reply was, "Roger Hotel Whiskey 10, your steer home is 130 degrees at 160 miles."

After recovering from the initial shock, my copilot and I surmised that either: a) Our ship was lost; b) Someone in Ops didn't like us; c) Our ship had drastically altered her PIM sometime in the past 4 hours; or d) The steer was inaccurate. (I tended to believe option "d," because the bearing was in the ball park of being consistent with the ship's projected PIM, but the distance given, though possible, was highly improbable.) Regardless of these considerations, in my mind, flying 160 miles to a no-TACAN ship totally violated squadron SOP (as well as any semblance of sanity). As I was preparing my negative response to this vector, the air boss said, "Hotel Whiskey 10, we have an E-2 overhead your ship that has positive contact and will provide vectors and flight following. Cleared to lift on LSE signal."

Armed with the confidence factor of the E-2, I rogered the air boss and headed for home. My playmate, who was conducting his last transport prior to refueling for the return trip, listened intently to these developments since we were to proceed independently. As I got airborne, I became convinced I'd be able to maintain constant radio communications with the E-2, but I still wasn't totally comfortable with the situation. If for some reason I couldn't find the AFS out at that distance, I knew that lack of remaining fuel could cause some of my return trip to the carrier to be accomplished via breaststroke. Also gnawing at the back of my mind was how far the AFS had broken the 100-mile distance if the 160-mile figure was indeed correct.

While inundating the E-2 with requests for position updates, I felt the return flight was proceeding well, as the relative motion of our ship showed her to be heading back toward the carrier, closing the distance we would have to fly. It was after we'd traveled 85 miles (based on time) that this whole evolution began to go haywire. Our E-2 began to hedge on the quality of the contact we were headed for as a basis for identification. It was also at this point when we began to establish radio communications with our AFS. We managed to get an intermittent UHF-DF radio steer that was about 40 degrees off of the vectors we were getting from the E-2, but believing this contact to be the only one in the area, we continued to follow our vectors. After traveling about 135 miles to the contact, we descended for landing, only to find that the contact was *not* our AFS but an oiler with absolutely no room for an H-46. As the dreaded pucker factor began to set in, we turned back toward the carrier while the E-2 made preparations for the carrier to close the distance between us. Because we still had radio communications with Homeplate and a UHF-DF heading showing her to the west, I chose to head in that direction, since it was nearly in the same direction as the carrier. The E-2, who was honestly doing his best to help us, then stated he had additional contacts to the south and east, but at that point, I decided to go with the UHF-DF, which had been fairly reliable thus far in the cruise.

As we headed west, the E-2 informed us there was a contact in that direction at about 60 miles. After what seemed an eternity, our homeplate radioed that it had picked us up on radar and began to vector us inbound. An A-7 from the carrier verified this contact as our AFS, and the E-2 assisted with more vectors. Unbeknownst to us, the AFS had turned off her radar and IFF all afternoon while conducting casualty drills, thereby making it pretty tough for the E-2 to find and pretty easy for us to get painted into a corner.

After leaving the carrier with 1,290 pounds of fuel per side, we finally landed on Homeplate with less than 325 (or 125 above NATOPS minimums) and what I felt had to be several newly-sprouted gray hairs on my previously untinted head. The actual distance between the AFS and the carrier was approximately 95 miles.

With that most unorthodox confirmation of the contact complete, the E-2 vectored my playmate back home without incident. After much thought and many self-inflicted "what might have beens," I can say that this incident impressed on me the importance of knowing **exactly** what USS Homeplate intends to do during any mission or extended absence and realizing that whenever we're going over the horizon on a "routine" mission, we should expect it to be anything but routine. ◄

"If for some reason I couldn't find the AFS out at that distance, I knew that lack of remaining fuel could cause some of my return trip to the carrier to be accomplished via breaststroke."

Panic in the cockpit!

By LT Doug Robbins
HSL-33

"I couldn't get my hand t

LISTEN to this one! I was the HAC in the left seat for an emergency procedures training flight. The PUI had not flown in 30 days, and SOP says that after going 30 days without flying, the pilot needs a warmup emergency hop. Our brief went as per NATOPS, and frankly, I was quite comfortable because I'd just shared a 7-month deployment with the PUI, not to mention the fact that we were also flying my pet Det bird. So, the stage was set for a 2.5-hour basic training flight.

After the PUI demonstrated various maneuvers at the OLF, we both felt he'd regained his proficiency, so we departed to the offshore dipping area. Our mission was to fly automatic and manual doppler hovers. On the way, I went through the pre-doppler checklist while the crewman strapped into the gunner's belt. We then completed the checklist while the crewman prepared several smokes for drop.

At time 15, we were established in our assigned area, 10 nm offshore. Our controller verified our position and requested an ops normal report at time 45. Very routine. The PUI was flying well, the aircraft was smooth, and everything was working as advertised.

We dropped a long-burning smoke to mark the simulated "survivor" and took note of the wind. The PUI then flew over the smoke and began his simulated automatic low-visibility IFR doppler approach. I was monitoring the radios and observing as the PUI and crewman executed the prebriefed, picture-perfect doppler approach. Like clockwork, everything was clicking extremely well, in fact, too well. Minutes later, we established a 40-foot hover just left and aft of the smoke. My left hand was on the collective and my thumb was on the beep switches. I kept an eye on the N_g and T_5 of both engines in order to avoid a compressor stall. At this point, the PUI was engrossed in maintaining a steady hover and responding to crewman voice calls.

The crewman had just said, "Easy right, steady, good hover, hoist going down." I shifted my scan from the engine and instrument gauges to my DVI in order to check our hover attitude. Then it happened. I heard a loud bang or explosion, as though a cannon had just been fired in the cockpit. I initially thought it was a compressor stall or something going crazy in the engine compartment. Immediately, I shoved my right hand forward against the cyclic stick in an attempt to achieve single-engine airspeed. As the aircraft tucked into a nosedown attitude, my vision became impaired by *Plexiglas* and a large object. A microsecond later, my left arm was thrown against the airframe. The force that drew my left arm off the collective caused my eyes to look down and left at what had happened. At that point I realized that a bird – a huge bird, still in one piece – had bounced off my collective and out of the aircraft!

There we were in a nosedown attitude, slow, with debris scattered everywhere in the cockpit. I tried to release the radar altimeter's hold on the collective so I could wave off, but my left hand could only touch the collective. I couldn't get my hand to that red button. I punched the ICS to tell the PUI to

d to that red button..."

wave off but got no side tone or response. I briefly caught the PUI's eyes and yelled cross-cockpit, "YOU'VE GOT IT. WAVE OFF! WAVE OFF!" I tried to pull power but did not have the strength to raise the collective. By this time the old adrenaline started to flow, and I mean it was **panic city**. I knew the PUI was unaware of what was going on because of his doppler-hover concentration, yet I could do nothing to effect an immediate waveoff or talk to the PUI.

Still in a noselow attitude, and noting some forward airspeed, I released the ASE on my cyclic stick in an attempt to try to pull up collective. Simultaneously, the PUI had taken quick note that there was something wrong and reacted with a positive power increase and a successful waveoff, which helped us leave our worries at hover altitude.

After regaining comfortable altitude and airspeed, I tried to envision what had taken place. The bird must have tried to overfly the aircraft. In doing so, it got sucked into the rotor system. Impacting the leading edge of a main rotor blade at the root, the bird was thrown downward into the copilot's overhead greenhouse window, shattering it. This was the cause of the loud explosion. Still in one piece, the bird continued down through the cockpit, thrusting itself against my left shoulder. That was why I couldn't move my left arm to the red button. The bird hit so hard that my left shoulder down to my hand was stunned and in intense pain. It just wouldn't move forward. To complicate matters even more, as it struck my shoulder, it also caught my ICS and UHF communication cord and disconnected me from any communication. I knew what the emergency was, but I couldn't talk and I couldn't move half of my body. Fortunately, the PUI reacted well to the call for power and waveoff.

This type of emergency is obviously not prebriefed. Recent AIRPAC messages suggest turning the landing light on to reduce possible birdstrikes. Still, even with the landing light on, birds do not file flight plans and sometimes go where and when they please.What happened to us might give all you helo pilots (and others) something to think about the next time you're in the wardroom. In that 2- to 3-second critical time lapse, damage to the aircraft was unknown, there was no communication, and the HAC couldn't react fully to the emergency. An interesting yet potentially grim situation.

Remember, no matter how thoroughly we prepare for each event, the unexpected and unpredictable can and will happen. Stay alert, fellow naval aviators. ◄

approach

THE NAVAL AVIATION SAFETY MAGAZINE

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APPROACH November Issue

Forbush

By Russ Forbush
APPROACH Writer

MY BOSS (the Editor) is one of those well-organized types — bless his little blue pencil. Every month, we writers get an assignment sheet listing proposed articles for the upcoming issue. Normally, we've already chosen and titled our brainchildren and are diligently pursuing their completion. This month, however, yours truly had drawn a blank until the assignment sheet arrived. What luck, I thought, as I perused the list of articles. There in bold type was my salvation, the perfect title, "3-Page Article," by Russ Forbush. Simple, well-defined; my boss's genius had once again electrified the air and provided the power to illuminate my creative light bulb. What a marvelous opportunity to nudge my ingenuity into action. Coming up with the right number of words to fill a three-page article (with illustrations) would be a daring challenge, but one I certainly felt up to. Since safety is our business, I was thoroughly aware that my piece would have to be slanted in that direction. No probs, I reasoned, we've been down those words, sentences, and paragraphs many times in the past. With enthusiasm, I set about the task at hand.

Now that I had a title, the next thing I had to do was choose a subject. I vowed on a stack of NATOPS manuals, however, that I wouldn't resort to projecting mishap missives or relating gory stories. What, then, shall I write about, I pondered. After what seemed like an all-day session of water survival training, the answer came to me with the speed of an attacking F-14. Why not a light discourse on that noblest of breeds — our ASOs — those stalwart standard bearers of aviation safety so often vilified but rarely glorified? Case in point: Who gets invited to the inner sanctum when the "old man's" parked car rubs fenders with a piece of squadron yellow gear? Case in point No. 2: When was the last time you saw one of our protectors of people and planes posed on the podium with his CO while he (the CO) smilingly accepted the CNO Aviation Safety Award? And who but an ASO knows the sickening feeling associated with not having a safety topic ready to present at tomorrow's AOM or a safety program set up for the following month. The leers and jeers of his squadronmates can prove unbearable. Most of us who have served as ASOs are well acquainted with the trauma this can bring on. Its symptoms usually begin with beads of sweat, progress to a serious case of nervous tics and, if not brought under control, can lead to a series of visits with the local Navy mindreader.

Now before some of you accuse me of being completely partisan towards ASOs, I want to make one thing perfectly clear (sound familiar?): my intention is to speak from both sides of the aisle. Ever since the Navy gave birth to the Naval Aviation Safety Program back in the early 1950s, thousands of its ASO offsprings have served with our various aviation units. As with all professions, however, we've had a few bottom-botchers mixed in with the top-notchers. To illustrate this, let's look at both ends of the gradient as it applies to ASOing in general and communicating in particular. A couple of examples follow:

Black Hat. The most forgettable ASO I ever knew could put a roomful of insomniacs to sleep in less than 45 seconds. He would invariably bombard the assemblage with a concoction of words designed to baffle even the most conscientious

listener. It normally took him 30 minutes or more to deliver his oratory, when 5 minutes would have been more than sufficient. The only time I can remember him getting the complete attention of his audience was when he concluded a boring presentation with these immortal words — "And don't forget, gentlemen, when it comes to aviation safety, there's no excuse for headwork."

There were three good reasons why this guy couldn't hack it as an ASO. First of all, he didn't know his aircraft — a cardinal sin. Secondly, he failed to organize a constructive safety program, which left everyone in the squadron pretty much on his own. And thirdly, he couldn't communicate. When operating aboard its assigned carrier, this squadron was a safety disaster. Their method of operation was akin to the antics of the Keystone Kops. Why did the CO select this particular ASO? That's simple! The CO placed a low priority on aviation safety. Therefore, it came as no surprise that this squadron had the highest aircraft mishap rate for its model aircraft that year.

White Hat. The following year, this same squadron got a new CO, who promptly designated a highly qualified and experienced second-tour aviator as his ASO. But qualifications weren't the only reason for his selection — the skipper felt this fellow had the communicating ability to get the safety message across to the troops. With the CO's blessing and backing, the ASO activated the dormant squadron aviation safety council, initiated the forming of an enlisted safety committee, and helped the NATOPS officer beef up the flight standardization program. No longer were token NATOPS exams administered and paper flight checks conducted. When some of the first aircrews tested failed these checks, the rest of the aircrews sensed that the new program was for real and attitudes changed for the better rapidly.

This ASO was also smart enough to know that he wasn't an expert in all training and operational areas as they applied to safety. Therefore, when he needed someone to present a certain subject, he contacted an outside activity that could provide an expert as a guest lecturer. By doing so, he helped ensure that the information passed on was both interesting and meaningful.

The CO's insistence that training, operations, safety, and maintenance be conducted in a highly professional manner began to pay off. Within a few months, this led to open communications at all levels, total personnel participation, and a high state of squadron readiness. It was anticlimactic that this outfit went mishap-free, won the CNO Aviation Safety Award, and received a grade of outstanding on their ORI. It didn't take these accolades (although highly prized) to convince every last member of the squadron that they had reached the pinnacle of professionalism; they already knew this and were mighty proud of it.

In the two examples above, it's obvious that communications played a vital role in the squadron's aviation safety program. The CO who insisted on open communications had a safe and ready squadron, while the other CO had anything but.

I wonder if I've reached the two-page point yet. Whew! I feel like an ASO who's trying to "wing it" at a standdown instead of really preparing, stammering in front of his audience and looking at his watch, wondering if he can possibly fill up the rest of his blank hours with a bag of shopworn safety slogans and boring transparencies . . .

Can someone really die of boredom?

Hey! That's another paragraph! I'll make it yet.

Seriously, I think we have to do more with our safety programs than just fill up allotted spaces. Along that line, consider this. A recent industry study concluded that communications efficiency is a two-way street — "giving and getting understanding." Did you know that you listen at an average rate of 400 to 800 words per minute, that public speakers talk at a rate of 100 words per minute, and that individuals converse at an average rate of 115 to 130 words per minute? This means that you listen at a rate that's at least four times greater than what is being said. Is it any wonder that we get bored while listening and even more so when we are acquainted with the subject being discussed? It was found that communications efficiency is high when dealing peer to peer, low when an adversary relationship is established. As we get lower in an organization, there are generally fewer opportunities for discussion, therefore more opportunities for misunderstanding. Every day, about 70 to 80 percent of our time is devoted to some form of communication: writing — 9 percent; reading — 16 percent; speaking — 30 percent; listening — 45 percent. Another interesting factor brought out in the study showed that communications efficiency was highest at the executive-to-executive level — 90 percent (in the Navy, this would equate as one admiral to another). The efficiency gradually decreases to 20 percent at the shop supervisor-to-worker level. Whether the data accumulated in the industry study truly relates to the Navy is a matter of conjecture, but when we consider the number of mishaps that occur every year because of a breakdown in communications, it's something to think about.

Having heard a number of talkers run off at the mouth, I was most surprised, as I'm sure you are now, that people listen so much faster than people talk. If this is the only thing you've learned in this article, maybe the next time you're called upon to make a presentation you'll know your subject thoroughly, choose your words well, and be prepared to answer any questions factually. Good luck!

If this article runs more or less than three pages, it's the art director's fault. Sometimes, he gets a mean streak in him and he'll deliberately make the illustrations bigger or smaller to suit his purpose! ◄

BRAVO ZULU

LTJG Fred Kilian
ENS Kevin Haines
VT-24

THIRTY minutes into the last leg of an AirNav cross-country in their TA-4J, LTJG Fred Kilian and ENS Kevin Haines of VT-24 began experiencing the first of what was to become a series of heart-stopping inflight problems. It started with the illumination of a fuel boost caution light. Due to a TACAN failure in his aircraft, LTJG Kilian was flying wing on a fellow SERGRAD instructor, 1stLt Roy A. Pearson. As LTJG Kilian radioed his lead to switch to the squadron tactical frequency in order to discuss his course of action, he observed the following: loss of his primary attitude gyro and standby gyro, loss of his BDHI, and illumination of a 20 percent LOW OIL QUANTITY warning light.

LTJG Kilian immediately informed the flight lead of his problems, declared an emergency to Center, and initiated a descent toward Mountain Home AFB, 50 miles straight ahead. First Lieutenant Pearson relinquished the lead and stood by to offer what assistance he could. As the two aircraft passed FL250, LTJG Kilian experienced even more problems: loss of all normal trim, landing gear indicators barberpoled to the unsafe position, and radios weak and nearly unreadable. Then, the air-conditioning unit went to an uncommanded "full hot," and he noticed the illumination of the UTILITY HYDRAULIC FAILURE caution light. At FL210, the trim ran away full left-wing down and both low fuel quantity lights illuminated. To make matters worse, the fire warning light started to flicker on and off and eventually stayed on. First Lieutenant Pearson advised LTJG Kilian that there were no external indications of fire.

Considering the rapid deterioration of the situation, LTJG Kilian opted to land at Boise International Airport, 20 miles closer than Mountain Home. With the numerous indications of combinations of electrical, hydraulic, possible bleed air duct failure, and engine failure, LTJG Kilian decided against deploying the RAT.

At this point, he had a flyable aircraft and did not wish to risk other possible problems that might occur with RAT deployment. He had a known situation and stuck with it. After executing a 360-degree turn for alignment and altitude loss, LTJG Kilian performed a flawless emergency precautionary approach to a short-field arrestment.

Postflight inspection revealed that the CSD had caught fire, causing the electrical malfunctions. The hydraulic failure was caused by a defective seal in the hydraulic pump.

Because of LTJG Kilian's alertness, skill, and cool head, this hair-raising experience resulted in merely a hazard instead of a serious mishap. ◄

Some Dangerous Shades of Gray

By LCDR Robert Bason, MSC

YOU'RE flying a 1 vs. 1 ACM engagement on a clear November morning over operating area East. The Atlantic sparkles 25,000 feet below you. Tally! There he is, coming toward you at twice the speed of heat, and you answer him with a hard right bank. Three G, 4G, and everything blurs to a narrow, heavy gray . . .

Things are getting grayer . . .

Where are you? If you've lost consciousness during these blank seconds, perhaps by wearing a disconnected anti-G suit or by not performing your M-1 or L-1 straining maneuvers, you've put yourself in a deadly situation.

During coordinated turns, pullups from dives, and "inside" maneuvers, you're accelerating through your head while an inertial force is acting toward your feet, forcing your body into your seat. The acceleration forces experienced during these maneuvers are positive G_Z forces ($+G_Z$). In today's high-performance aircraft, inflight loss of consciousness (LOC) as a result of $+G_Z$ is a rarely discussed but real threat to the tactical jet aviator.

Naval Safety Center data from 1 January 1969 to 30 December 1981 indicates that 13 tactical jet aircrewmen experienced altered states of consciousness due to $+G_Z$ forces. Seven cases involved grayout or blackout, and six cases included LOC episodes. Of the seven fliers experiencing grayout or blackout, two were wearing functional anti-G suits properly connected to their aircraft, and two, because of "incompatibility with their antiexposure suits," were not wearing anti-G suits. No information regarding the use of anti-G suits for the other three aviators was reported. Case-by-case examination of the flight surgeon's report narratives for the six aviators experiencing LOC indicates that only one was a confirmed LOC episode and the five others were suspected cases of LOC induced by high $+G_Z$ forces. Information on the use of anti-G suits in these six cases was not available. Four of the six aviators were lost at sea.

In the period examined (1969 through 1981), sufficient information was available in only 13 cases to suspect $+G_Z$ forces as a mishap factor. These cases, however, raise a very serious question. In how many other fatal mishaps was the flier incapacitated by $+G_Z$ forces and rendered unable to eject? In many fatal mishaps, the available data is inadequate for ascertaining whether adverse $+G_Z$ forces are to blame. Because of crash impact and absence of witnesses, reconstructing such transitory aspects as departure from controlled flight and the effect of G-loading upon the aircrew become all but impossible.

In military flying, acceleration stresses will increase as the performance characteristics of aircraft increase. Therefore, in the interest of mishap prevention, we've got to better understand the forces and factors that can either increase or decrease acceleration tolerance. Without such an understanding by flight surgeons and flightcrews, many avoidable accidents will continue to take place, and entries in the "cause undetermined" mishap category will continue. Let's take a look at what positive G forces can do to your body.

Cardiovascular System. Positive G forces score a direct hit on your cardiovascular system. Your blood is a fluid supported by elastic vessels and depends upon specific pressures for normal function. During $+G_Z$ acceleration, the weight of your body fluids (as well as elements of the body) increases. Because of the increased weight of the blood and the elasticity of the blood vessels, blood pooling in the legs occurs.

This pooling of blood in your legs results in an inadequate blood flow to the brain. Depending upon the duration of this inadequate blood flow to the brain, you may experience grayout, tunnel vision, blackout, or total loss of consciousness. The effects of $+G_Z$ are illustrated in Fig. 1:

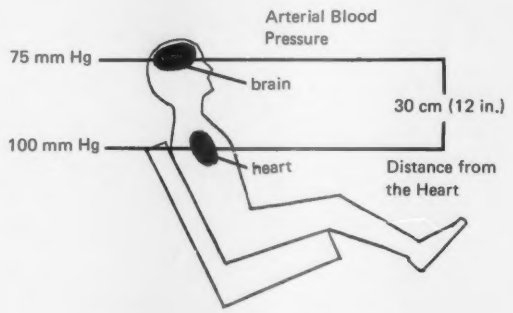

Fig. 1. Hydrostatic effects on arterial blood pressure in a seated individual under $+1G_Z$.

The distance from the heart to the brain is about 30 centimeters. Think of the main blood vessels from the heart to the brain as a column of fluid. Under conditions of $+G_Z$, this 30-cm column of fluid exerts a hydrostatic pressure of 25 millimeters of mercury (mm Hg). If the main arterial blood pressure at the heart level is 100 mm Hg, then the pressure at the brain is 75 mm Hg, 25 mm Hg lower than the blood pressure at the heart level, because of the 25 mm Hg of hydrostatic pressure that must be overcome. **For each additional positive G, the blood pressure at the brain is reduced another 25 mm Hg.** At $+4G_Z$, for example, the blood pressure of the brain falls to zero if the blood pressure at the heart remains unchanged, because the hydrostatic

pressure opposing the blood flow increases four times, to 100 mm Hg. This suggests that one would routinely lose consciousness upon exposure to $+4G_Z$. This is not the case, however, since physiological protective mechanisms compensate by increasing blood pressure and blood flow to the brain. In general, forces lasting less than 2 seconds have little effect on the cardiovascular system. By and large, the physiological protective mechanisms become inadequate once you exceed $+5G_Z$.

In the unprotected individual, loss of peripheral vision and reduction in visual acuity (grayout) occur at levels of +3 to $+4G_Z$. When G forces reach +4 to $+4.5G_Z$, vision is lost and blackout occurs. At this point the individual is still conscious and can hear and respond. Loss of consciousness in an unprotected individual usually occurs under a load of +4.5 to $+6G_Z$ for more than 6 seconds.

Grayout can be an ominous warning that blackout or LOC is imminent. *Note, however, that under rapidly applied acceleration forces of large magnitude, consciousness may be lost without any intervening period of grayout or blackout.* Likewise, an individual may become unconscious while the acceleration load is decreasing. While recovery from grayout and blackout is rapid once G-loading is reduced, there is still a several-second delay until full reorientation is gained. Many erroneous control inputs have been initiated by pilots who have not fully recovered from G-loading.

Unconsciousness must be considered life threatening, even at high altitudes. The time of functional incapacitation during $+G_Z$-induced LOC is approximately 15 seconds. This is true even if the G stress is removed within 3 seconds after LOC. Also, during recovery, a flier may not realize he hasn't been conscious and may also develop amnesia concerning events immediately preceding LOC.

There is a great deal of variation between individuals in their ability to perform under $+G_Z$ acceleration. Any factor that reduces the overall efficiency of the body, especially if it reduces the reserves of the circulatory system, causes a marked reduction in $+G_Z$ tolerance. **Some of the more common factors that can reduce $+G_Z$ tolerance levels are low blood pressure, dehydration, hypoxia, warm temperature, fatigue, and self-imposed stresses.**

Increasing Your G Tolerance

The ability of a high-performance jet pilot to tolerate a higher $+G_Z$ (head to foot) stress than his opponent during aerial combat maneuvering may well determine the outcome of an engagement. Currently, the only protective measures available to naval aircrew flying high-performance aircraft are the anti-G suit and the M-1 and L-1 straining maneuvers. Increased $+G_Z$ protection of the anti-G suit above present levels must await technological improvements. Improved tolerance with the straining maneuvers, however, can be acted upon today.

Exercise that conditions your muscles in the same manner in which they are used to perform a skill will result in increased strength, endurance, and coordination when you demonstrate that skill. There is sufficient evidence today that clearly indicates that weight training and breathing designed to simulate loads on the muscles involved in the M-1 and L-1 straining maneuvers will result in increased $+G_Z$ tolerance. **Likewise, there is mounting evidence to suggest that excessive aerobic training, such as running in excess of 15 to 20 miles per week, is not beneficial and may in fact be detrimental to one's $+G_Z$ tolerance.** The following is a conditioning program that will increase strength, endurance, and efficiency in the muscles used in the performance of the M-1 and L-1 straining maneuvers and thus enhance the $+G_Z$ tolerance provided by these straining maneuvers.

Isotonic Weight Training. This weight training program for improved $+G_Z$ tolerance is an isotonic program. Isotonic weight training is the shortening of a muscle or groups of muscles as tension is developed. Exercise is performed with free weights or weight stacks on *Universal Gym* or *Nautilus* equipment.

Repetition Maximum (RM). One of the most important concepts of isotonic weight training is the concept of repetition maximum. Repetition maximum is the maximum weight a group of muscles can lift a given number of times before fatiguing. For example, if an individual can lift a given weight load 10 times and no more before fatiguing, the weight is a 10-RM load.

Determination of RM Load. How can an individual determine a starting RM load for various weight-lifting exercises? The best way is by trial and error — lifting several loads over a period of time to determine the load that can be lifted a specified number of times just to the point of fatiguing. In addition, rough estimates for a starting load may be determined from your body weight as follows:

Arm Curls — Use a weight that is equal to 40 percent of your body weight.

Bent Rowing — Use a weight that is equal to 60 percent of your body weight.

Bench Press — Use a weight that is equal to 80 percent of your body weight.

Leg Press — Use a weight that is equal to 100 percent of your body weight plus 20 pounds.

Arm Pull Down — Use a weight that is equal to 75 percent of your body weight.

Upright Rowing — Use a weight that is equal to 50 percent of your body weight.

It is not possible to claim with absolute confidence that a certain RM load is correct. There are, however, some guidelines that may be helpful. If you're unable to perform the indicated number of repetitions, then the selected weight may be either too high or just right, depending upon how close to the suggested number of repetitions you come. If for example, 80 percent or more of the suggested number of repetitions can be performed in good fashion, the weight

load is perhaps not too high. If you can perform the full number of suggested repetitions or more, the weight load is too low.

Sets and Repetitions. Once the proper RM load has been determined, the muscles can be exercised as follows:

Set 1 — 10 repetitions at a one-half 10-RM load
Set 2 — 10 repetitions at a three-quarter 10-RM load
Set 3 — 10 repetitions at a 10-RM load

Let's examine the structure of the above program in more detail. Assume that the exercise is for arm curls and that the RM load is 80 pounds. The program requires three sets of arm curls. A set is the number of repetitions performed consecutively without rest. The first set is performed for 10 repetitions at 40 pounds without resting. Upon completion of Set 1 and after a brief rest period, Set 2 is performed by lifting 60 pounds 10 times. Following a brief rest period after Set 2, Set 3 is performed by lifting 80 pounds 10 times without resting. The first two sets are basically designed as warmups, while the third set should develop muscle strength and endurance. Once again, it's hard to categorically state that any one combination of sets and RM load is better than another. Because everyone's time is valuable, I recommend that your isotonic strength programs consist of only two sets at a 10-RM load per exercise. The first set should be performed at one-half 10-RM load for warmup and the second set at the 10-RM load for muscle development.

Frequency and Duration. An isotonic weight training program of 3 days a week performed on alternate days is sufficient to produce significant gains in muscular strength and endurance and to avoid the fatigue of inadequate day-to-day recovery. Adequate rest between sets of the same exercise and between groups of different exercises is also important. The rest period between sets of a given exercise should be no longer than the time it takes to change the workload. During the first 2 weeks of the weight training program, the rest period between different exercises should be no more than 5 to 10 minutes. Thereafter, it should be no more than 60 seconds. During the first 2 weeks of training, the trainee should concentrate on learning the proper style of performing the exercise. After the second week, time becomes critical to development of muscular strength, endurance, and efficiency.

Increasing the Workload. Once the 10-RM load has been determined, this load should be continued until 15 repetitions are possible. Do not increase the weight until you can do 15 repetitions. Once the 15 repetitions can be accomplished, increase the weight load to reduce the number of repetitions back to a 10-RM load.

Preliminary Exercise/Warmup. Before every workout, spend 5 to 10 minutes performing some stretching exercises. Cold, stiff muscles and joints are prone to injury. The warm-up should consist of calisthenics to exercise the arms, legs, shoulders, chest, and back.

Weight Training Program. The following is a detailed description of a conditioning program for enhanced $+G_z$ tolerance:

• **Sit-up** (abdominal exercise) (Fig. 2). Lie on a mat on your back with feet flat on the floor and knees flexed. Sit up as far as you can with a curling motion of the trunk, contracting the abdominal muscles as much as possible. Reach forward with your arms as you sit up. Slowly lower to the starting position.

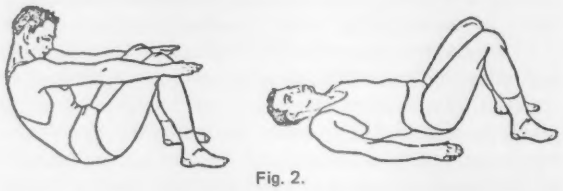

Fig. 2.

• **Sit-up** (alternate method) (Fig. 3). Another method for doing sit-ups is to lie on an 18- to 20-degree incline bench with your head down and your knees in a bent position. From this position, sit up to a position of about 20 degrees from vertical.

Work until you can perform 20 repetitions. Once 20 repetitions can be performed, hold a 2¼- to 5-pound free weight on your chest to increase the resistance. Work with this until 20 repetitions can once again be performed, then increase the weight once again.

Fig. 3.

• **Arm Curls** (bicep exercise) (Fig. 4). Hold the barbell in front of your thighs with palms forward and hands about shoulder-width apart. Raise the weight by flexing your arms at the elbows until arms are fully bent and the bar is touching the chest. Elbows should be kept at the sides but should not be braced against the body or moved backward or forward. The bar should be lifted in a continuous motion without jerking or using a backbend. The weight should be lowered slowly in the same manner until your arms are fully extended.

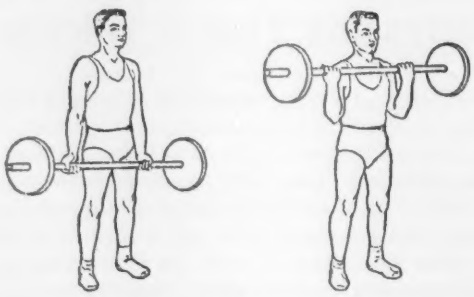

Fig. 4.

• **Bent Rowing** (upper back) (Fig. 5). Grasp the bar with palms back and hands slightly farther than shoulder-width apart. Your body is bent at the hips to form a right angle, and your knees are bent slightly. Keep your back flat. Pull the weight up until it touches your chest just below the nipple line. Do not jerk the weight up or lower the trunk to meet it. Now lower the weight until it's just above the floor and your arms are extended.

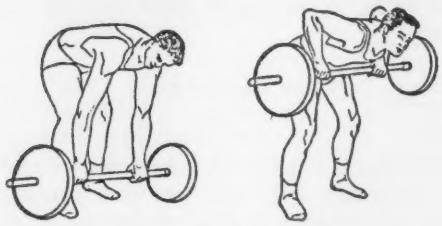

Fig. 5.

• **Bench Press** (chest, arms, shoulders) (Fig. 6). Lying on back on a bench, hold a barbell over your chest with arms extended and palms forward toward your feet. Arms should be slightly farther than shoulder-width apart. Lower the weight by bending your arms, elbows outward to sides, until it touches your chest. When working with free weights, ensure you push the weight up to the starting position.

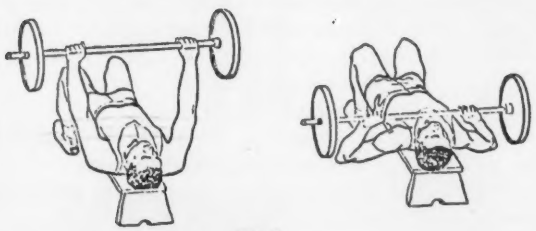

Fig. 6.

• **Pulldown Lat Machine** (neck, shoulders) (Fig. 7). Sit on the end of a bench or kneel on the floor. Grasp the bar of the lat machine in a pronated grip, with the hands more than shoulder-width apart. Pull the bar down behind your head until it touches the base of the neck and shoulders. Return to starting position and repeat.

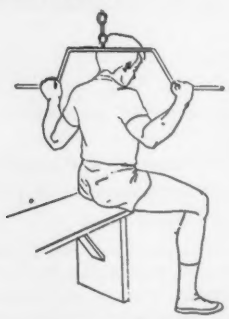

Fig. 7.

• **Press Behind Neck.** With this exercise you use a barbell as an alternative to the pulldown lat machine. Stand erect and hold a barbell in front of your chest with hands about shoulder-width apart. Raise the weight overhead by fully entending your arms, then lower the barbell behind your neck.

• **Knee Bend** (leg exercise) (Fig. 8). Place a barbell on your shoulders. A towel may be used to pad the bar. Spread your feet slightly. Lower to a squatting position until your upper leg is parallel to the floor and then immediately rise to the starting position. Look straight ahead as you go down and up as you rise. Do not round your back; keep it as flat as possible. Keep as erect as possible throughout the exercise. To avoid back injury, correct form is essential in this exercise.

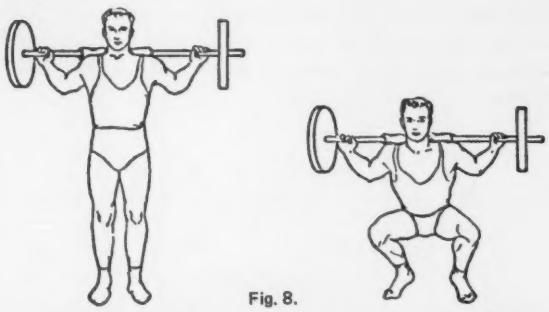

Fig. 8.

• **Pullover** (chest and shoulder exercise) (Fig. 9). Lie on your back on a bench about 9 to 12 inches wide. Hold a barbell above your chest with your palms forward and your arms locked. Keeping your arms locked, lower the weight to a position over your head, at the same time inhaling as deeply as possible. Then raise the weight to the starting position in an arc and lower it slowly to your thighs. Raise the weight again, repeating the exercise.

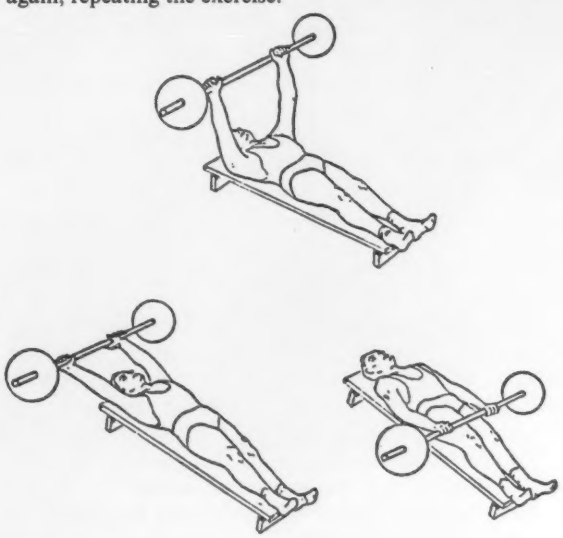

Fig. 9.

Supplementary Exercises

• **Upright Rowing** (upper back). Stand with the barbell held at hip-level in front of and close to your body, keeping your hands close together (almost touching) and in a pronated grip. Lift the barbell to chin-height, keeping the elbows out so that the barbell stays close to your body; then lower it to hip-level. Repeat.

• **Lateral Arm Raise** (shoulders) (Fig. 10). Hold a dumbbell in each hand with palms facing each other and arms hanging at sides. Raise your arms out and to the side until they are above shoulder level. Now, return to the starting position. Keep your arms extended and locked at the elbows.

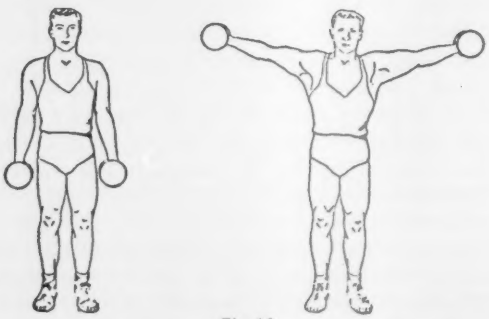

Fig. 10.

• **Neck Flexion and Extension** (neck). This exercise can be performed with your hand positioned on one side of the four sides of your head.

• Attempt to nod your head against interlocked fingers held against your forehead.

• Repeat with fingers held against the back of your head.

• Tilt your head sideways against the base of your hand, assist with the other hand. Repeat in the opposite direction.

In neck flexion and extension exercises, sustain contractions for approximately 10 seconds in each position. Perform two sets with five repetitions per set. Rest 30 to 60 seconds between sets.

Aerobic Training. There is a threshold intensity of aerobic training above which significant gains in fitness occur. The minimal threshold level of training varies from individual to individual and is also related to the initial level of fitness. Can an individual determine his minimal intensity level?

There is no standard answer to this question. Research studies suggest that the minimal threshold for cardiovascular improvement is approximately 60 percent of maximum heart rate reserve. For example, an individual with a resting heart rate of 70 beats per minute and a maximal heart rate of 195 beats per minute should begin a program so that the heart rate during exercise is:

$$195 - 70 = 125 \times 0.6 = 75 + 70 = 145 \text{ beats per minute}$$

In order to use the above method for determining the training intensity, the maximum heart rate must be known. Direct determination of maximum heart rate is often difficult. However, reasonable estimates for males and females based on age may be made from the following equation:

$$\text{Maximal Heart Rate} = 220 - \text{Age}$$

Present studies also tend to suggest that a frequency of aerobic training of 2 to 3 days per week is necessary for adequate improvement of the cardiovascular system. Participation of less than 2 days per week does not show adequate change in cardiovascular improvement, while the amount of improvement tends to plateau when the training frequency is increased above 3 days per week.

Your best bet is to exercise at 60 percent to 80 percent of maximal heart rate, using higher percentages as you obtain better conditioning. Exercise should be performed at the desired level for 20 to 30 minutes, 3 days per week, alternating aerobic-conditioning days with weight-training days. Running distance does not have to exceed 3 miles per day. The goal of this aerobic program might be directed toward attaining Dr. Ken Cooper's excellent category (Category V) for cardiovascular fitness.

Summary of Conditioning Program

• Every workout should be proceeded by stretching exercises and 5 to 10 minutes of general warmup.

• Aerobic and weight training should each be performed 3 days per week and on alternate days.

• Two sets of 10 repetitions, one at one-half 10-RM load, and one at the 10-RM load, should be performed before beginning the next exercise.

• Rest periods between exercises within a set should be no more than the time it takes to change the weights.

• During the first 2 weeks, the rest period between different exercises should be no more than 5 to 10 minutes. After the second week, the rest periods should be no more than 60 seconds.

• When 15 repetitions of a 10-RM load can be accomplished, readjust poundage for a new 10-RM load.

• Aerobic running exercise does not have to exceed more than 3 miles per day.

• Keep a log of your progress and review it weekly.

• You should show improvement in your positive "G" tolerance within 3 to 4 weeks.

Acknowledgement. *With the exception of Fig. 2, illustrations and their explanations are taken from the Physiological Basis of Physical Education and Athletics, 2/e by Donald K. Matthews and Edward L. Fox, © 1976 by W. B. Saunders Company. Reprinted by permission of Holt, Rinehart and Winston, CBS College Publishing.*

SURVIVAL EQUIPMENT

It's in your hands

By CDR Douglas W. Call, MSC, USN
Pacific Missile Test Center
Point Mugu, California

AN item of survival equipment used improperly can be as useless to an aircrewman in an emergency as one that fails. Therefore, teaching a man to use his gear correctly

is as important as good equipment design.

The Naval Air Systems Command (NAVAIRSYSCOM), Washington, DC, has the responsibility to ensure that all items of personal survival equipment entering service are designed properly and that Navy and Marine aircrews are trained to use them. Proper design is a dynamic process, as modifications to existing aviation life support must keep pace with changing fleet needs. One way NAVAIRSYSCOM keeps abreast of these changing needs is through the actions of the Integrated Logistic Support/Acquisition Management Panel (ILS/AMP) for aviation life support systems (ALSS).

This panel initiates the flow of events necessary to get required changes into existing items of aviation survival equipment. A representative from NAVAIRSYSCOM chairs this group and is assisted by members from various headquarters, development, logistics, and fleet commands. Their collective job is to review fleet-reported difficulties with survival equipment and determine the best way to solve them. Figure 1 outlines procedures the ILS/AMP can use to resolve ALSS problems which do not require developing completely new items of survival equipment.

1. *Operational Training* – Sometimes the difficulty lies with improper use of, or failure to use, the survival item rather than with the equipment itself. If this is so, aircrew training techniques can be revised and the problem can be solved in as little as 6 months. The Chief of Naval Operations, Codes OP59/931, is responsible for operational training on in-service survival equipment.

2. *Integrated Logistic Support* – If the ALSS problem is the result of improper logistic support, it can often be rapidly solved by improving supply and maintenance procedures. NAVAIRSYSCOM Code 411 follows these actions.

3. *Design Change* – When a design change to survival equipment is required, NAVAIRSYSCOM 531 must assure that it is done correctly and introduced to the fleet properly.

The Parachute Four-Line Release System is an example of a recent ALSS modification which entered fleet service through the *design change* route. This was in response to a longstanding problem with the 28-foot flat parachute, i.e., it oscillates badly during descent and is not steerable. This can lead to extreme discomfort (airsickness) during descent and potential landing injuries, thus decreasing the aircrewman's survival chances. Sustained engineering efforts

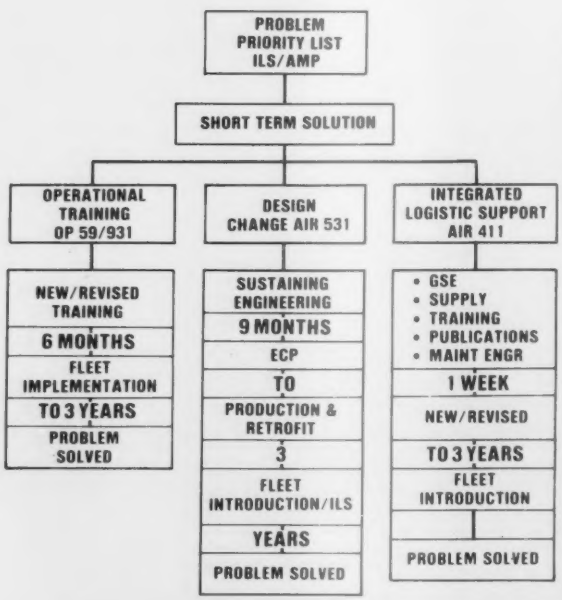

FIGURE 1. ALSS ILS/AMP PROBLEM/SOLUTION FLOW CHART

at the National Parachute Test Range, El Centro, CA, led to a design change described in an engineering change proposal. Instructions to incorporate this change were contained in Aircrew Systems Change No. 383. This alteration required no special kits, as all materials necessary to produce the change and retrofit all in-service parachutes were on hand in the paralofts where the work was performed. Thus, the parachute four-line release was introduced to the fleet and an ILS plan was written to support the program. This did not completely solve the problem, however. The four-line release modification does not happen automatically. An aircrewman must be taught to use it when he needs it. This is done through proper operator (aircrew) indoctrination. Only then is the problem truly solved.

NAVAIRSYSCOM has recently improved this training by using standardized operator indoctrination packages. These training materials are produced by the Pacific Missile Test Center, Point Mugu, CA and distributed Navy-wide to all naval aviation physiology and water survival training sites and to individual aviation medical safety officer concurrent with fleet introduction of the new or modified survival equipment. These indoctrination packages take several formats:

1. Slides with narratives
2. Videotapes
3. 16mm movies
4. Demonstrators, mockups of ALSS
5. Articles in aviation safety publications

The indoctrination packages are used at the squadron/unit level, both to introduce the aircrew members to ALSS modifications and teach them techniques to use each properly. Therefore, crewmen are trained at the same time their survival equipment changes. Before this program existed, it was possible for a man to be flying with survival equipment for some time before he received adequate training on how to use it. The recent extension of the refresher aviation physiology and water survival training cycles to 4 years makes these squadron-level presentations even more important.

The first of these operator indoctrination packages introduced fleet aircrew personnel to the "Parachute Four-Line Release Systems.". The package included a set of 38 slides with narrative, a 16mm movie, a demonstration for classroom or readyroom use, and a "Dynamic Parachute Four-Line Release Simulator" to give aircrewmen the opportunity to actually operate the four-line release and practice other postegress procedures while suspended under a simulated parachute. The last installment in this operator indoctrination package was an article, "The New Four-Line Release System," which appeared in the FEB '80 issue of *APPROACH*. Therefore, during the 2 years following this parachute change, thousands of Navy and Marine Corps fliers learned of its value and how to use it through one or more portions of the operator indoctrination package.

After this successful start, the operator training concept has been applied to all new or modified items of ALSS. These training materials are currently introducing fleet aircrew to: FLU-8A/P Automatic Lifevest Inflator; Beaded Inflation Handles for Lifevests; Aircraft Onboard Oxygen Generating Systems; new chinstrap and ear cup suspension system for helicopter aircrew helmets; and the new HGU-33/34 series aircrew helmets and MBU-14/P soft hose oxygen masks. From January 1981 to June 1982, over 30,000 aircrew personnel heard briefings on one or more of these life support systems via operator indoctrination packages. These talks were given in squadron spaces during safety standdowns and at aviation physiology training units as part of NAVAIRSYSCOM's FAILSAFE program. FAILSAFE, an acronym for Fleet Air Introduction/Liaison Survival Aircrew Flight Equipment, is a program designed to provide Navy and Marine Corps aircrewmen timely information on survival equipment changes. The Pacific Missile Test Center will soon release introductory materials on changes to the MA-2 torso harness and the mobile helicopter crewman's raft. Other survival equipment changes will be introduced by this method as they occur.

The more you know about survival equipment, the more likely you'll be to trust it and use it correctly when the time comes. Timely presentation of operator indoctrination materials can help provide the knowledge which leads to this trust.

If your squadron/activity would like more information about operator indoctrination packages and the FAILSAFE program, call your local Aviation Physiology Training Unit or Aviation Medical Safety Officer (AMSO). ◄

The DISAPPEARANCE

By LT Colin W. Sargent

The helicopters at the top of this page have been searching for you for 2 minutes now. The water is dark green. Terrain? Open ocean. General weather conditions? Rough, cold, and windy. Aircraft? A Navy jet. Situation?

You were downwind in the carrier bounce pattern, flying a deep 90 this time before turning into the groove. During the last approach, you'd run into 48 knots of headwind right here at the 90, and it was funny — as if you were flying backwards for a while.

Everything looked great as you continued your turn. You liked wind adjustments. Wind was one of the variables that kept carrier ops interesting to a third-tour aviator like you. Fine tuning things a tad slower or faster. Working on that elusive 1 percent of finesse that can prevent everyday pilots from becoming . . .

Oh! What's that? Another hydraulic failure? Let's see now. No real problems, said the calm little voice that had pulled you through so many close ones in the past.

"Boss, 204's got fluctuating hydraulic pressure. I want to land."

"204, Roger."

Up ahead, the island's antennas and green eyes stared at you while you found the groove. Adept and calm, you flew a textbook approach to an extremely satisfactory arrested landing. That hit the spot! You felt the reassuring recoil of the No. 3 wire as you decelerated.

"Really nailed that one," you said to yourself, relaxing your inflight concentration a bit as you rolled to a stop. You looked around. A small rainstorm was sweeping across the carrier deck.

Another uneventful Monday.

Your mind took a snapshot of your postflight world. The island, the usual steam from the cats, the yellow shirt signaling for wire retraction and for you to pull your hook up . . . these small events on deck seemed like footnotes compared to the flight adventure you'd just finished writing in the sky.

Following the yellow shirt's signals, you raised your hook, folded your wings, engaged nose gear steering, and used brakes while taxiing clear of the area. Next stop, the

dearming platform.

The little rainstorm was heading west now. Watching the storm, it didn't occur to you that you'd forgotten something **big**. Lulled by the familiar hand signals, you taxied to the No. 1 elevator, where the yellow shirt handed you over to the dearm taxi director. Guided by his directions, you continued forward until slowing to a stop 5 to 10 feet inboard of elevator No. 1. Raising your hands, you indicated you were ready for dearming.

Suddenly, the **big something** you'd forgotten about exploded into a fountain of pressurized reality gushing from the skein of aluminum veins beneath your wing. It gushed its way clear into your memory. The hydraulic failure!

It was then that you and your jet started moving again, nudged forward by residual idle thrust toward the edge of the carrier's steel cliff and a vertical drop to green seawater.

No amount of brake stomping could help you. Your hands were still up and visible above the canopy rails while you shook your head vigorously back and forth in answer to the director's signal for brakes.

Exasperated, you jumped on the UHF: "Boss, no brakes on 204!"

Two seconds later, the air boss was on the 5MC, screaming over and over, "Get chocks on that Navy jet — no brakes!"

Everyone froze.

Then, like Lilliputians, a dozen flight deck personnel in multicolored jerseys grabbed your main gear, wings, and control surfaces in an attempt to stop you.

They didn't have a chance. There were 48 knots of wind whipping across the slippery flight deck, and no chocks or obstructions were readily available.

By the way, looking down at you from his 32-foot perch in the island, your tower rep was extremely surprised by these events. In fact, he'd never heard your UHF report of hydraulic problems and was amazed to see you make an arrested landing instead of a touch and go. He'd been distracted by another recovery episode and couldn't even see well, much less hear the radios.

Perhaps you should have made a bigger deal of your hydraulic problem. At the very least, you might have remembered that you had one!

No one should have had to tie a string around your finger to remind you to consult your own pocket checklist. In stark black nouns and verbs, the blue plastic book stated that you were supposed to remain in the arresting gear until you could be pinned and towed away. Now the edge of the carrier deck was moving toward you very quickly. It was time for an instantaneous ejection decision.

Why had you relaxed your concentration once you had the trap in the bag? It was easy. A lot of pilots do it! Some helicopter pilots, for instance, let down quite a bit after they've finished negotiating a landing to the bobbing spot of a SPRUANCE-class destroyer, even though their tip path plane may be only half a rotor diameter away from the superstructure, ripping through the sky nearly as fast as the speed of sound.

Some multiengine pilots relax a little early during GCA rollouts, even though they're still buzzing down active runways.

Maybe quite a few naval aviators are letting their caution drop a bit prematurely — while they're finished with the sky flying but still right in the middle of some critical taxi situations . . .

Your brakes still wouldn't stop you, and surprise still showed on your face. Your silent indecision narrated the next few seconds as you reached immediately for the face curtain, then back into the cockpit, then back to the face curtain, only to remove your hands one last time as your Navy jet started over the side.

You and your aircraft disappeared from view.

That amazed you even more. In your years of flying, you'd developed a false sense of security in believing that the deck edge coaming (not designed to stop aircraft) and the personnel safety nets (also not designed to stop aircraft) would stop you. Those unreinforced steel rumors didn't hold you for an instant. And as far as the history of planes hanging in the catwalks was concerned, well, there aren't any catwalks around a carrier's elevators!

Everyone on the flight deck was watching you disappear.

One observer would later say, "If any man had seen the expression I did, when the pilot knew he was going over with the aircraft . . . it is one expression I'll never forget."

Another saw it this way: "Running toward the area, I heard the air boss say, 'Somebody do something with that airplane.' Then to see the vertical fin rising upward and over the side of the elevator. The flight deck was wet and slippery. I ran toward elevator No. 1, only to see aircraft 204 go over the edge."

Witness No. 3: "Suddenly I heard the boss yell over the 5MC, '204 has no brakes!' I turned to my right and saw the jet approximately 35 to 40 feet from the starboard side of the ship, traveling outboard. His speed was not excessive for taxi. Approximately 5 feet from the outboard edge of elevator No. 1, I saw the pilot's right hand reach for his face curtain. The aircraft proceeded over the side and paused momentarily (a split second) in a see-saw motion. The rest of the aircraft continued overboard and disappeared from my view."

Well, you haven't disappeared entirely, even though you diluted your survival chances by not ejecting. You egress the cockpit and swim to the surface.

Cold water can really douse the warm amnesia you get from overfamiliarity. From now on, your flights won't end until your engines are cold, you've drunk a glass of purple bug juice, and you're resting in your stateroom for the next launch.

The helicopters move in for the pickup.

Your legend may be soaking wet, but it's worth it — you're never going to let your caution roll over the deck edge again! ◄

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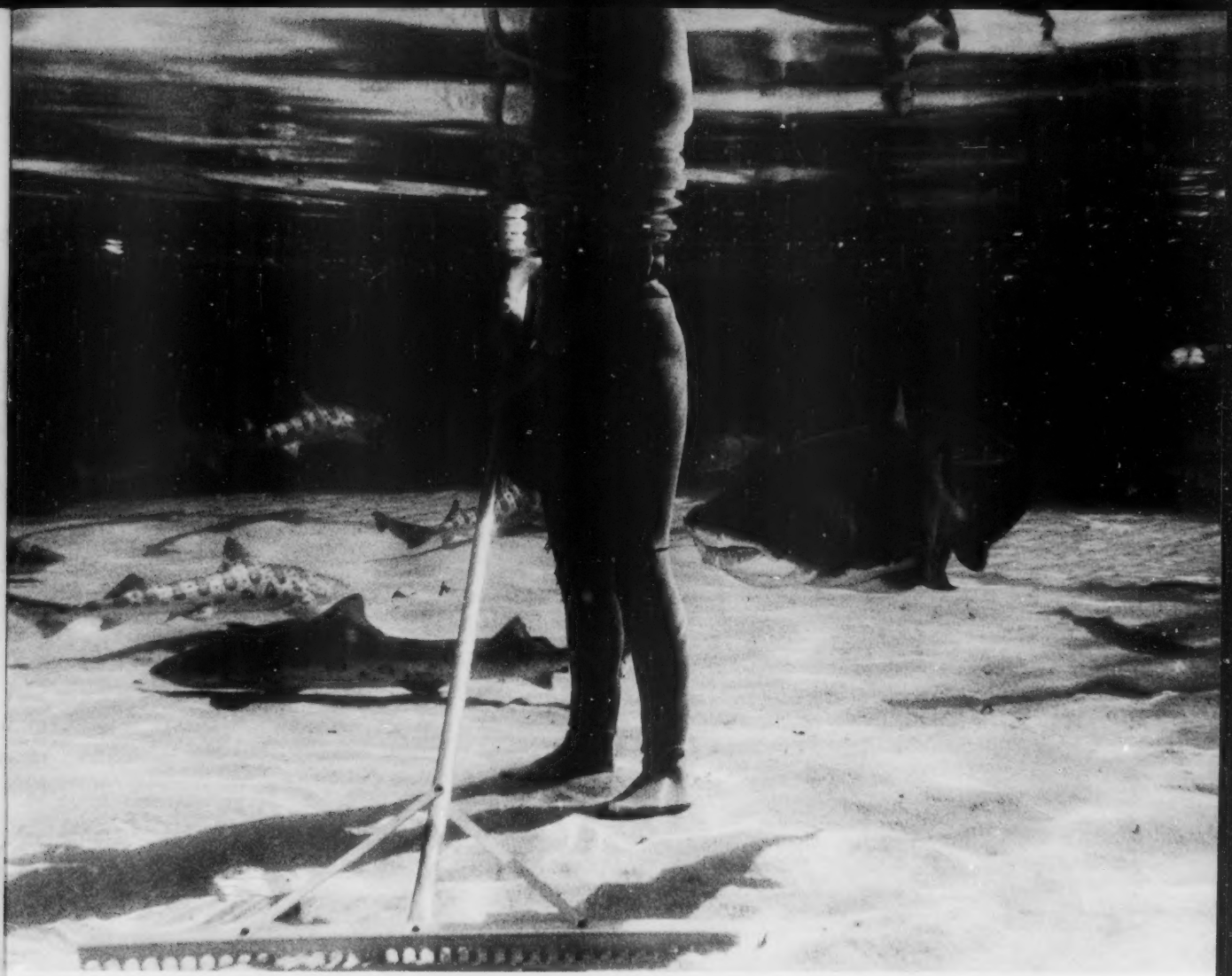

Sea World Photo/Chris Gotshall

Professionals in safety can do dangerous jobs, with total confidence, day after day.

Poster idea contributed by LCDR Jay Tyler, VAQ-138 Yellowjacket Safety Officer.

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Inflight safety . . .
What's your perspective?